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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Gerardus Claessen

Serial No.: 10/036,218

Filed: October 23, 2001

For: METHODS AND APPARATUS FOR A SPREAD SPECTRUM MODULATED BACKSCATTER ELECTRONIC SHELF LABEL SYSTEM

Group: 2637

Examiner: Tran, Khai

Durham, North Carolina
March 14, 2006

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

CERTIFICATION OF FACSIMILE TRANSMISSION

Sirs:

I hereby certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office, Fax. No. 571-273-8300 on the date set forth below

1. Transmittal of Appeal Brief (2 pages);
2. Appeal Brief (17 pages).

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Marianna Tortorelli
Signature

Date: March 14, 2006

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of	:	Gerardus Claessen
For	:	Methods and Apparatus for a Spread Spectrum Modulated Backscatter Electronic Shelf Label System
Serial No.	:	10/036,218
Filed	:	10/23/2001
Group	:	2637
Examiner	:	Tran, Khai

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March 14, 2006

MAIL STOP APPEAL BRIEF – PATENTS
Commissioner for Patents
P.O. Box 1450
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APPELLANT'S BRIEF

Sir:

1. The Real Party In Interest

The real party in interest is the assignee, NCR Corporation.

2. Related Appeals and Interferences

None.

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3. Status of the Claims

This is an appeal from the final Action mailed October 27, 2005 ("final Action") of claims 1-33, all of the pending claims. Claims 1-33 were rejected under 35 U.S.C. § 103(a) as unpatentable over Herman et al. U.S. Patent No. 6,108,367 ("Herman") in view of Carrender U.S. Patent Publication No. 2002/0149484 A1 ("Carrender"). Pending claims 1-33 are the subject of this appeal.

4. Status of Amendments

The claims stand as last amended on August 10, 2005. No Amendment After-Final has been filed.

5. Summary of Claimed Subject Matter

Conventional electronic shelf label (ESL) systems typically include a plurality of ESLs for each type of merchandise item in a store. ESLs display the price of corresponding merchandise items on store shelves. A conventional electronic shelf label (ESL) system uses wireless communications to communicate from a communication base station (CBS) to an ESL. In such an approach, the communication from the CBS to the ESL, the downlink, uses amplitude modulated Manchester coded data. For communication from the ESL to the CBS, the uplink, a continuous carrier wave transmitted by the CBS that is remodulated by the ESL and reflected back to the CBS may be utilized. This technique is known as modulated backscatter or remodulated carrier wave (CW). In such a system, the uplink communication is only used for an ESL to acknowledge receipt and correct execution of the message received by the ESL. The uplink information may be modulated as a single continuous frequency lasting 360 milliseconds (ms), for example. Only a limited number of different modulating frequencies are available for the uplink. Application software running on the CBS typically infers the status of the ESL from

a sequence of interrogation messages to which the ESL either responds with an acknowledgment or does not respond at all, requiring the CBS to determine memory integrity, broken display glass or battery condition, push button depression, or the like.

With this context in mind, we turn to one aspect of the present invention. Pursuant to this aspect, claims 1, 16, and 24 are directed to an improved electronic shelf label (ESL) system, an improved ESL communication method, and an improved ESL apparatus which claim a digital modulation technique for a modulated backscatter uplink from the ESL, in order to transmit additional information from the ESL to a communication base station (CBS).

By way of example, claim 1 includes an ESL (e.g., Fig. 2, element 122) and a communication base station (CBS) (e.g., Fig. 1, element 120). The ESL receives a message transmitted from a communications base station (CBS). See, e.g. specification p. 5, lines 6-11 and Fig. 1, elements 120 and 122. The ESL includes a transmitter (e.g., Fig. 3) having a generator (e.g., Fig. 3, element 301) for producing a pseudo-random code sequence. See, e.g., specification, p. 6, line 3 – p. 7, line 20. The transmitter (e.g., Fig. 3) transmits a response to the message by reflectively modulating a continuous wave (CW) signal with the generated pseudo-random code sequence so as to impose the pseudo-random code sequence on the continuous wave signal. See, e.g., specification, p. 2, lines 12-19. The CBS receives and correlates the reflectively modulated CW signal. See, e.g., specification, p. 8, line 12 – p. 9, line 16.

Pursuant to an additional aspect of the present invention, claims 3, 17, and 26 are directed towards selection of the pseudo-random code sequence or of the seed upon which a pseudo-random code sequence is based to correspond to a particular response generated by the ESL. See, e.g., specification, p. 10, lines 2-4 and Fig. 5.

6. Grounds of Rejection to be Reviewed on Appeal

Claims 1-33 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Herman in view of Carrender.

7. Argument

The final rejection under 35 U.S.C. § 103 did not follow M.P.E.P. § 706.02(j) which states:

> After indicating that the rejection is under 35 U.S.C. 103, the Examiner should set forth...the difference or differences in the claim over the applied reference,...the proposed modification of the applied reference(s) necessary to arrive at the claimed subject matter, and ... an explanation why one of ordinary skill in the art at the time the invention was made would have been motivated to make the proposed modification.

As will be illustrated below, the claims of the present invention are not obvious in view of the references relied upon by the Examiner.

A. Rejection under 35 U.S.C. § 103(a) over Herman in view of Carrender

This sole rejection is not supported by the relied upon art. 35 U.S.C. § 103 which governs obviousness indicates that "differences between the subject matter sought to be patented and the prior art" are to be assessed based upon "the subject matter as a whole". Analyzing the entirety of each claim, the rejections under 35 U.S.C. § 103 are not supported by the relied upon art as addressed further below. Only after an analysis of the individual references has been made can it then be considered whether it is fair to combine teachings. However, as addressed further below, fairness requires an analysis of failure of others, the lack of recognition of the problem, and must avoid the improper hindsight reconstruction of the present invention. Such an analysis should consider whether the modifications are actually suggested by the references rather than assuming they are obvious. The sole 35 U.S.C. § 103 rejection made here picks and chooses elements from two separate references, neither of which presents any motivation for making the

suggested combination. This approach constitutes impermissible hindsight and must be avoided. As required by 35 U.S.C. § 103, claims must be considered as a whole. When so considered, the present claims are not obvious.

Turning to the references relied upon, both Herman and Carrender address problems only peripherally related to the solutions provided by the present invention. Herman describes a two-way low-power communication system for an electronic shelf label system including a controller 91 controlling two antennas 13 and 22 which collectively act as a transceiver and multiple ESLs 95. Herman, Abstract, col. 4, lines 10-28 and Fig. 8. To communicate data from the transceiver to an ESL, the transceiver's transmitted signal is a double side-band amplitude modulated (DSB AM) transmission with an underlying Direct Sequence Spread Spectrum (DSS) Pseudo-Random sequence of N chips for each data bit that modulates the carrier. Herman, col. 4, lines 13-18. The transceiver's transmitted signal is carried on a 2.4 Ghz carrier. Herman, col. 4, line 18. The ESL comprises an antenna, diode, oscillator, and microcontroller. Herman, Fig. 6. To communicate data from the ESL to the transceiver, the diode is used to mix the received signal from the transceiver with the oscillator. Data to be sent to the transceiver is then modulated by the inverting phase of the oscillator frequency causing a reflective differential Binary Phase-Shift Keyed modulation signal to the transceiver. Herman, col. 4, lines 46-58. As admitted at p. 2, lines 21-23 in the final Action, Herman fails to disclose and fails to suggest that the ESL modulates the received signal with a pseudo-random code sequence so as to impose the pseudo-random code sequence on the signal as claimed.

Carrender fails to cure the deficiencies of Herman. Carrender addresses a frequency-hopping radio frequency identification (RFID) system which includes an RF interrogator or reader and an RFID tag. The RF interrogator uses a frequency-hopping source to generate and

transmit interrogation signals at pseudo-randomly selected frequencies which are then reflected by an RFID tag. Carrender, p. 1, ¶ [0012]. The RFID tag does not generate a pseudo-random code sequence and does not modulate the received signal with the pseudo-random code sequence so as to impose the pseudo-random code sequence on the signal, as claimed by claim 1. Instead, the only pseudo-random code modulation possibly performed by Carrender, like Herman, is performed by the interrogator or the transceiver in Herman, not by the ESL. Carrendar, p. 2, ¶ [0017]. Thus, Carrendar does not add any more relevant disclosure than Herman.

Claims 1, 16, and 24

Unlike Herman and Carrender, claims 1, 16, and 24 address an ESL having a transmitter which includes a generator for producing a pseudo-random code sequence. For example, claim 1 recites "an ESL receiving a message transmitted from a communications base station (CBS), the ESL including a transmitter having a generator for producing a pseudo-random code sequence, the transmitter transmitting a response to the message by reflectively modulating a continuous wave (CW) signal with the pseudo-random code sequence so as to impose the pseudo-random code sequence on the continuous wave signal." Pseudo-random code modulation of a received signal by the ESL, as claimed by claims 1, 16, and 24, advantageously allows for an increased data communication capability by the ESL.

Herman and Carrender do not address pseudo-random code modulation by an ESL of a received signal. In particular, Herman and Carrender, taken separately or in combination, do not teach and do not suggest "the ESL including a transmitter having a generator for producing a pseudo-random code sequence, the transmitter transmitting a response to the message by reflectively modulating a continuous wave (CW) signal with the pseudo-random code sequence so as to impose the pseudo-random code sequence on the continuous wave signal," as claimed in

claim 1.

At page 3, first paragraph, the final Action suggests combining the teachings of Herman and Carrender because it would have been obvious "to implement the PN generator for generating a plurality of pseudo-random code sequences as taught by Carrendar [frequency hopping in the RFID interrogator] into the teachings of Herman in order to perform a correlation and receive matched data." Even if Herman and Carrender were combined as the final Action suggests, the resulting combination would fail to meet the features of claim 1. The resulting combination would simply incorporate the frequency hopper found in the RFID interrogator to change carrier frequencies of a transmitted signal generated from Herman's transceiver. Such a combination would require Herman's ESL to add a complex antenna which can variably tune to the hopped carrier frequency rather than the simple antenna tuned to center frequency 2.4 Ghz as disclosed in Herman. See Herman, col. 4, lines 28-34. Herman and Carrender cannot be combined as suggested and, even if they could be so combined, their combination would fail to meet the terms of claims 1, 16, and 24. Thus, claims 1, 16, and 24 define over the cited art and should be allowed.

It has been shown all the elements of claims 1, 16, and 24 have not been taught or suggest by the combination of Herman and Carrender. Assuming for the sake of argument that the combination of Herman and Carrender did show each element of the claims, which it does not, there is no motivation to combine Herman and Carrender.

In the Response to Arguments section, the final Action purportedly addresses Applicant's previous argument that the RFID tag of Carrender does not generate a pseudo-random code sequence and does not modulate the received signals with the ESL generated pseudo-random code sequence so as to impose the pseudo-random code sequence on the signal of claim 1. In so

doing, the final Action states that "there are many ways of implementing the frequency hopping source 24." Applicant finds the final Action's application of the cited text off point and puzzling. The final Action's application of the cited text reflects both a misunderstanding of the present claims, and Appellant's arguments regarding Carrender.

The cited text can be found in ¶ [0019] of Carrender immediately after Carrender discloses that "the frequency-hopping source 24 is readily commercially available and will not be described in detail herein." Thus, the cited text appears to be merely used to relieve the drafter of Carrender from describing the details of the frequency-hopping source 24. More importantly, the frequency-hopping source 24 which hops carrier frequencies for signals transmitted from the RFID interrogator has nothing to do with an ESL generating a pseudo-random code sequence as claimed. Carrender discloses no means in the RFID tag for generating a pseudo-random code sequence, and it should be noted that RFID tags are typically very low cost passive devices. In closing, this cited text from Carrender clearly has nothing to do with an ESL modulating the received signal with the generated pseudo-random code sequence as claimed.

Claims 3, 17, and 26

Claims 3, 17, and 26 are directed towards selecting the pseudo-random sequence or the seed upon which a pseudo-random sequence is based to correspond to a particular response generated by the ESL. For example, claim 3 recites "wherein the pseudo-random code sequence is selected by the ESL from a plurality of pseudo-random code sequences to correspond to a particular response." Since Herman and Carrender do not generate a pseudo-random code sequence at the ESL or RFID tag, respectively, the relied upon art has no need to select a pseudo-random code sequence or seed to correspond to a particular response. Additionally, the

transceiver in Herman generates a pseudo-random code sequence. In this way, Herman's ESL has no way to select one to correspond to a particular ESL response. Herman's ESL merely reflects the same pseudo-random code sequence received and adds data by modulating the inverted phase of the ESL's oscillator. Consequently, Herman and Carrendar, taken separately or in combination, do not teach and do not suggest a pseudo-random code sequence selected by the ESL to correspond to a particular response as claimed.

Overall, Applicant is somewhat puzzled by the Examiner's response to the previously submitted arguments and the apparent refusal of the Examiner to consider both the plain language and the context of the present claims. The relied upon references do not teach and do not render obvious an ESL having a generator for producing a pseudo-random code sequence which performs the presently claimed functions.

To sum up, Herman and Carrender do not show and do not suggest a system and method for reflectively modulating a continuous wave signal with the pseudo-random code sequence generated in the ESL as presently claimed. Nothing in the cited references indicates a recognition of the problem of increasing the information bandwidth from the ESL to the communication base station addressed by the present invention. Further, nothing in the cited references indicates a system which would solve the problems addressed by the present invention. The claims of the present invention are not taught, are not inherent, and are not obvious in light of the art relied upon.

C. The Examiner's Findings of Obviousness are Also Contrary to Law of the Federal Circuit

As shown above, the invention claimed is not suggested by the relied upon prior art. The references cited by the Examiner, if anything, teach away from the present invention. It is only in hindsight, after seeing the claimed invention, that the Examiner could combine the references

as the Examiner has done. This approach is improper under the law of the Federal Circuit, which has stated that "[w]hen prior art references require selective combination by the Court to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gleaned from the invention itself." Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1051, 5 U.S.P.Q. 2d 1434, 1438 (Fed. Cir. 1988), cert. den., 109 S. Ct. 75, 102 L.Ed. 2d 51 (1988); quoting Interconnect Planning Corp. v. Feil, 774 F.2d 1132, 1132, 227 U.S.P.Q. 543, 535 (Fed. Cir. 1985). Furthermore, "[i]t is impermissible to use the claims as a frame and the prior art references as a mosaic to piece together a facsimile of the claimed invention." Uniroyal, 837 F.2d at 1051, 5 U.S.P.Q. 2d at 1438. Similarly, "[t]he mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification." In re Laskowski, 871 F.2d 115, 117, 10 U.S.P.Q. 2d 1397, 1398 (Fed. Cir. 1989), quoting In re Gordon, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984). No such suggestion is found here.

In addition, the Examiner does not appear to have considered "where the references diverge and teach away from the claimed invention", Akzo N.V. v. International Trade Commission, 808 F.2d 1471, 1481, 1 U.S.P.Q. 2d 1241, 1246 (Fed. Cir. 1986), cert. den., 107 S. Ct. 2490, 482 U.S. 909, 107 S.Ct. 2490 (1987); and W.L. Gore Associates, Inc., 721 F.2d 1540, 220 U.S.P.Q. 303 (Fed. Cir. 1983); nor has the Examiner read the claims as a whole, as required by statute. 35 U.S.C. §103. See also, Smithkline Diagnostics Inc. v. Helena Laboratories Corp., 859 F.2d 878, 885, 8 U.S.P.Q. 2d 1468, 1475 (Fed. Cir. 1988); and Interconnect Planning Corp., 774 F.2d at 1143, 227 U.S.P.Q. at 551.

In In re Laskowski, 871 F.2d 115, 10 U.S.P.Q. 2d 1397, the Federal Circuit reversed an obviousness rejection of the claims in an application for a bandsaw. The claimed bandsaw used

a pulley type wheel loosely fitted with a tire. The primary reference showed a similar bandsaw where the band was tightly fitted. The Federal Circuit stated that the prior art did not provide a suggestion, reason or motivation to make the modification of the reference proposed by the Commissioner. Id. at 1398. The Court added that "there must be some logical reason apparent from the positive, concrete evidence of record which justifies a combination of primary and secondary references." Id. quoting In re Regel, 526 F.2d 1399, 1403, 188 U.S.P.Q. 136, 139 (C.C.P.A. 1975), citing In re Stemniski, 444 F.2d 581, 170 U.S.P.Q. 343 (C.C.P.A. 1971).

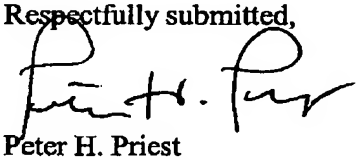
In Uniroyal Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 5 U.S.P.Q. 2d 1434 (Fed. Cir. 1988), cert. den., 109 S. Ct. 75, 102 L.Ed. 2d 51 (1988), the Federal Circuit reversed the District Court's finding that the claims for a patent for an air flow deflecting shield were obvious. Without any suggestion in the art, the District Court improperly chose features from several prior art references to recreate the claimed invention.

The Examiner's rejection suggests that the Examiner did not consider and appreciate the claims as a whole. The claims disclose a unique combination with many features and advantages not shown in the art.

8. Conclusion

The rejection of claims 1-33 should be reversed and the application promptly allowed.

Respectfully submitted,



Peter H. Priest
Reg. No. 30,210
Priest & Goldstein, PLLC
5015 Southpark Drive, Suite 230
Durham, NC 27713
(919) 806-1600

CLAIMS APPENDIX
(Claims Under Appeal)

1. An electronic price label (ESL) system comprising:

an ESL receiving a message transmitted from a communications base station (CBS), the ESL including a transmitter having a generator for producing a pseudo-random code sequence, the transmitter transmitting a response to the message by reflectively modulating a continuous wave (CW) signal with the pseudo-random code sequence so as to impose the pseudo-random code sequence on the continuous wave signal; and

the CBS receiving and correlating the reflectively modulated CW signal.

2. The ESL system of claim 1 wherein the CW signal is transmitted by the CBS during a time period in which the ESL responds.

3. The ESL system of claim 1 wherein the pseudo-random code sequence is selected by the ESL from a plurality of pseudo-random code sequences to correspond to a particular response.

4. The ESL system of claim 1 wherein the pseudo-random code sequence is modulated onto a carrier, the carrier reflectively modulating the CW signal received from the CBS.

5. The ESL system of claim 3 wherein the carrier oscillates at about 32 kHz.

6. The ESL system of claim 3 wherein the response exhibits a remodulated spectrum ~~is~~ centered around the carrier.

7. The ESL system of claim 1 wherein the message is transmitted to the ESL using a Manchester coded amplitude modulated carrier.

8. The ESL system of claim 1 wherein the message includes a command instructing

the ESL to perform an action and the response includes an acknowledgement indicating the ESL successfully performed the action.

9. The ESL system of claim 1 wherein the ESL selects a seed value corresponding to the response.

10. The ESL system of claim 9 wherein the ESL generates the pseudo-random code sequence based on the seed value.

11. The ESL system of claim 10 wherein the ESL modulates the code sequence onto a carrier to generate a digitally modulated signal.

12. The ESL system of claim 11 wherein the ESL transmits the response by varying a reflection of the CW with the digitally modulated signal.

13. The ESL system of claim 12 wherein the CBS bandpass filters the response and performs demodulation to remove the carrier.

14. The ESL system of claim 13 wherein the CBS correlates the response.

15. The ESL system of claim 14 wherein the CBS relays the response to a host system for identification.

16. An electronic shelf label (ESL) communication method comprising the steps of:

transmitting a message to an ESL from a communications base station (CBS);

generating a pseudo-random code sequence at the ESL;

transmitting a response by the ESL to the message by reflectively modulating a continuous wave (CW) signal with the generated pseudo-random code sequence so as to impose the pseudo-random code sequence onto the continuous wave signal; and

receiving and correlating the reflectively modulated CW signal by the CBS.

17. The method of claim 16 further comprising the step of:

selecting a seed value corresponding to the response by the ESL.

18. The method of claim 17 further comprising the step of:

generating the pseudo-random code sequence based on the seed value by the ESL.

19. The method of claim 18 further comprising the step of:

modulating the code sequence onto a carrier to generate a digitally modulated signal by the ESL.

20. The method of claim 19 further comprising the step of:

transmitting the response by varying a reflection of the CW signal with the digitally modulated signal.

21. The method of claim 20 further comprising the steps of:

bandpass filtering the response; and

performing demodulation to remove the carrier.

22. The method of claim 21 further comprising the step of:

correlating the response.

23. The method of claim 22 further comprising the step of:

relaying the correlated response to a host system for identification.

24. An electronic price label (ESL) comprising:

an ESL receiving a message transmitted from a communications base station (CBS), the ESL including a transmitter having a generator for producing a pseudo-random code sequence, the transmitter transmitting a response to the message by reflectively modulating a continuous wave (CW) signal with the pseudo-random code sequence so as to impose the pseudo-random code sequence onto the continuous wave signal.

25. The ESL of claim 24 wherein the CW signal is transmitted by the CBS during a

time period in which the ESL responds and the CBS receives and correlates the reflectively modulated CW signal.

26. The ESL of claim 24 wherein the pseudo-random code sequence is selected by the ESL from a plurality of pseudo-random code sequences to correspond to a particular response.

27. The ESL of claim 24 wherein the pseudo-random code sequence is modulated onto a carrier, the carrier reflectively modulating the CW signal received from the CBS.

28. The ESL of claim 24 wherein the message is transmitted to the ESL using a Manchester coded amplitude modulated carrier.

29. The ESL of claim 28 wherein the message includes a command instructing the ESL to perform an action and the response includes an acknowledgement indicating the ESL successfully performed the action.

30. The ESL of claim 24 wherein the ESL selects a seed value corresponding to the response.

31. The ESL of claim 30 wherein the ESL generates the pseudo-random code sequence based on the seed value.

32. The ESL of claim 31 wherein the ESL modulates the code sequence onto a carrier to generate a digitally modulated signal.

33. The ESL of claim 32 wherein the ESL transmits the response by varying a reflection of the CW with the digitally modulated signal.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.

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MAIL STOP APPEAL BRIEF – PATENTS
Commissioner for Patents
P.O. Box 1450
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TRANSMITTAL OF APPELLANT'S BRIEF

1. Transmitted herewith is the APPEAL BRIEF in this application with respect to the Notice of Appeal filed on January 26, 2006.

2. The Applicant is other than a small entity.

3. Pursuant to 37 CFR 1.17(f) the fee for filing the Appeal Brief is $500.00.

   [x] The Commissioner is hereby authorized to charge the fee of $500 to NCR Corporation Deposit Account No. 14-0225.

   [x] The Commissioner is hereby authorized to charge any additional fees which may be required including any fee for extension of time or credit any overpayment to NCR Corporation Deposit Account No. 14-0225. Should such an extension

become due, this letter constitutes a petition requesting same. A DUPLICATE COPY OF THIS SHEET IS ATTACHED.

Respectfully submitted,

Peter H. Priest
Reg. No. 30,210
Priest & Goldstein, PLLC
5015 Southpark Drive, Suite 230
Durham, NC 27713
(919) 806-1600